

Computer simulation

- From class web page in lab sections open **“PhET Gas Laws Simulation”**
- Launch the simulation

URL:

<http://phet.colorado.edu/en/simulation/gas-properties>

-OR-

- Google: “gas law PhET simulation”

Before you answering questions...

That you can...

1. Add both heavy and light gases to the container
2. Adjust the temperature of the container while holding the pressure constant
3. Decrease the volume of the container

PhET Gas Simulation Turn In

Answer all question on separate sheet of paper labeled “PhET Gas Simulation”

Compose a properly formatted email to send graphs saved to a single sheet as a pdf. and forward to Mr. Golden by 12:30pm 5.Mar.2018. Save pdf. as follows, “pX.FirstLast.phetgaslaws1718”

BELL WORK, 2-Mar-2018

Write a balanced equation for the reaction below:
Zinc and hydrochloric acid react to form Zinc (II)
Chloride and Hydrogen gas

In series of trials a student recorded the following data
when reacting Zinc and Hydrochloric acid

	Trial A	Trial B
Mass of Zinc (M.M. 65g/mol)	5.00g	10.0g
Moles of Zinc		
Mass of HCl (M.M. 36g/mol)	15.0g	18.0g
Moles of HCl		
Mole ratio of zinc to HCl		
What is the Limiting reagent		
Moles of H ₂ gas formed		

Agenda

Pressure units and Kelvin

Objective

You will be able to convert between different pressure units.

What is pressure?

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

Units of Pressure

$$1 \text{ pascal (Pa)} = 1 \text{ N/m}^2$$

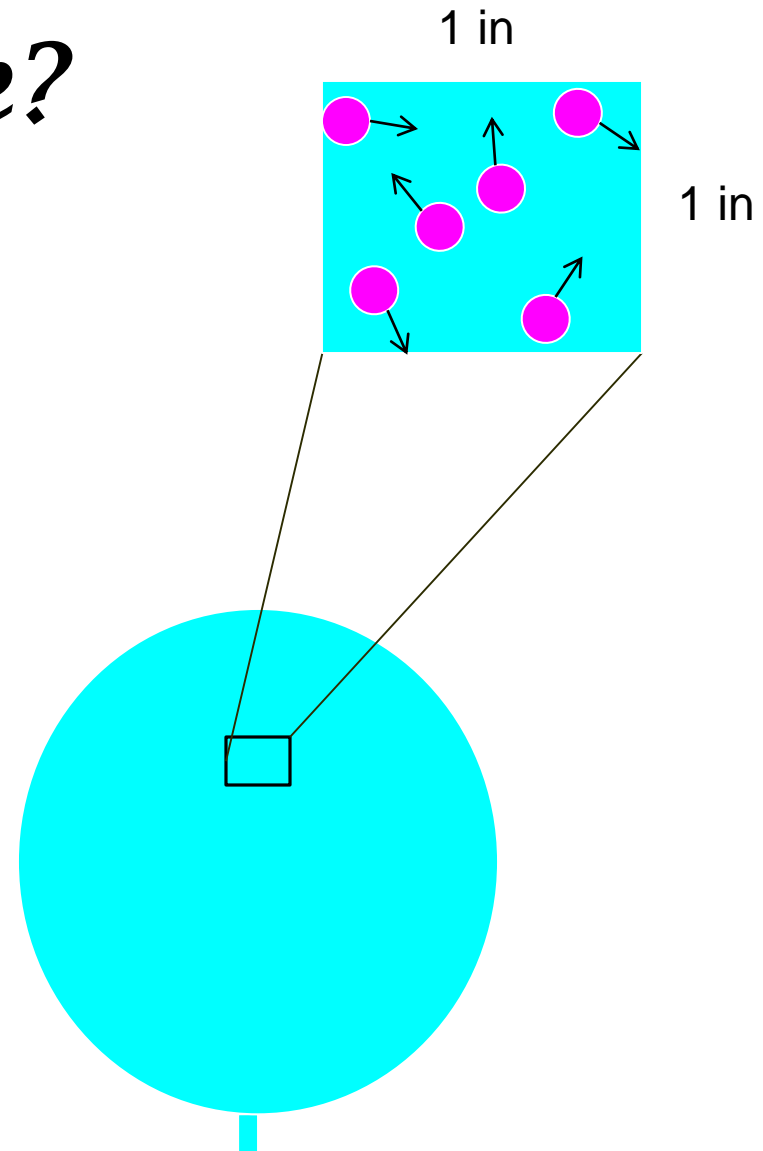
$$1 \text{ atm} =$$

$$760 \text{ mmHg} =$$

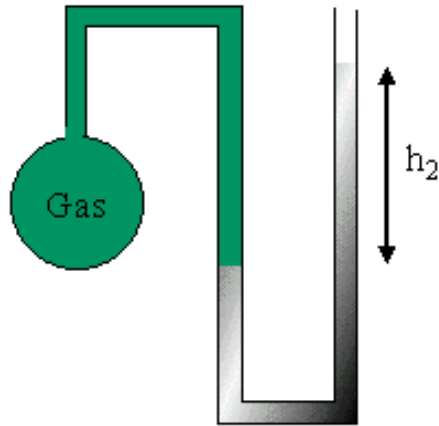
$$760 \text{ torr} =$$

$$101.325 \text{ kPa} =$$

$$14.7 \text{ psi}$$

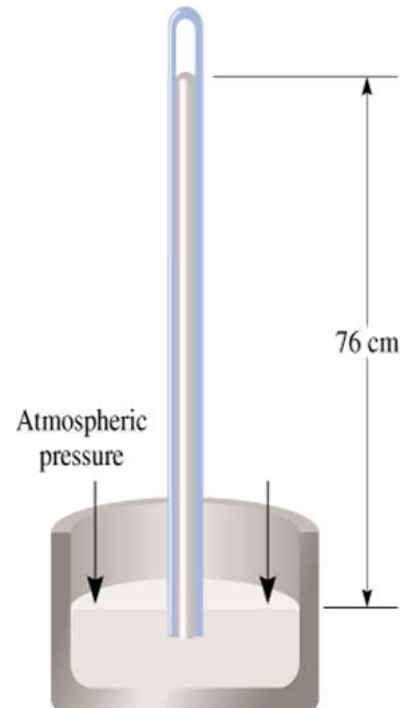


How do we measure pressure?

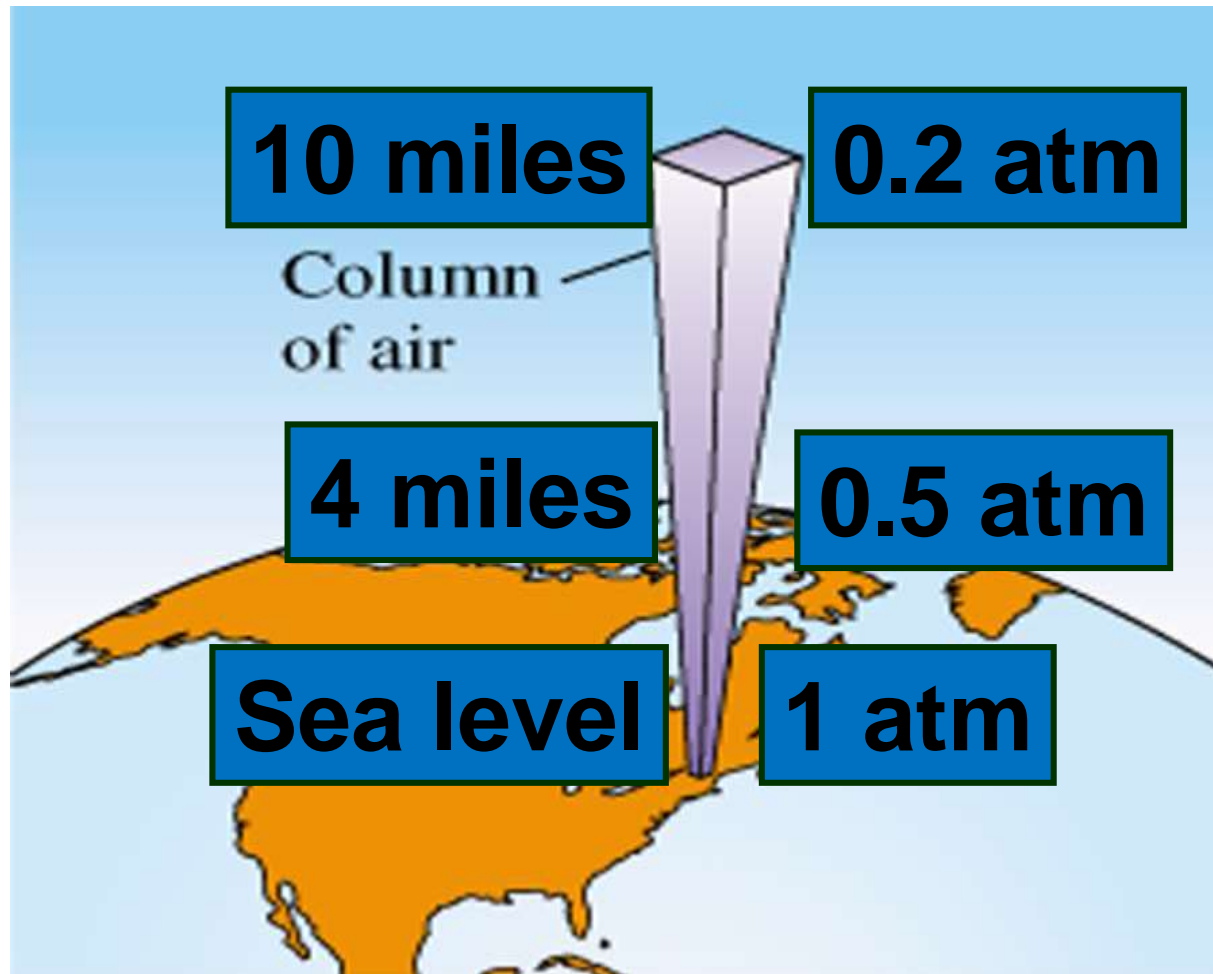


A manometer uses a U-shaped tube of liquid to measure pressure differences on either side of the liquid

A barometer uses the height of a column of mercury to measure gas pressure in mmHg



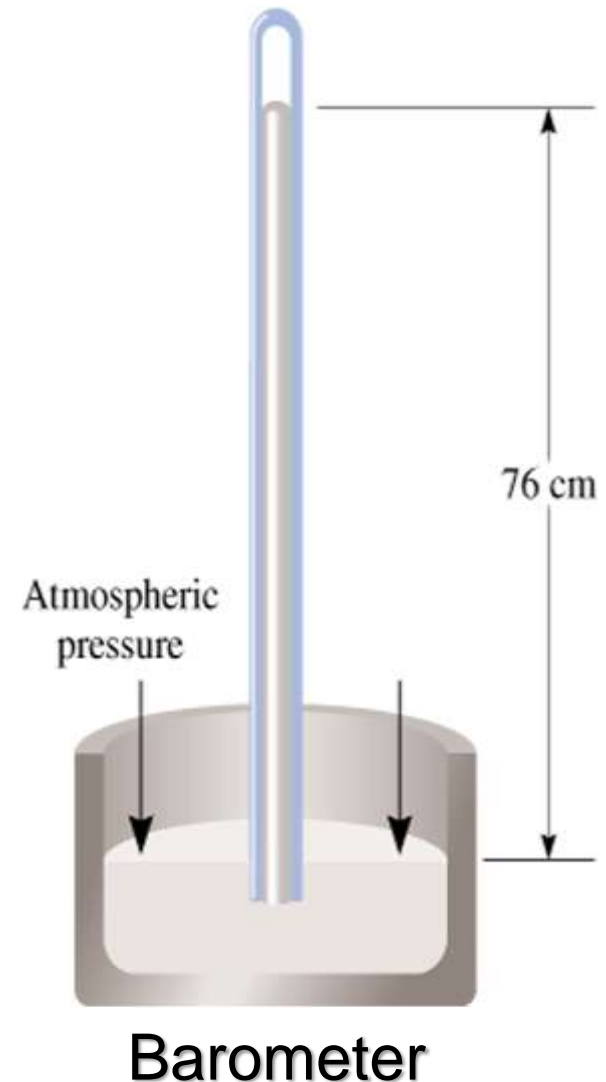
What is the pressure in mmHg at sea level?
What is the pressure in Pascals at sea level?



Try this...

Convert:

- 1. 727 mmHg into kPa**
- 2. 52.5 kPa into atm**
- 3. 0.729 atm into mmHg**
- 4. 522 torr into kPa**
- 5. 800.0 mmHg into atm**
- 6. 495 Pa into mmHg**



Standard Temperature and Pressure

Standard temperature and pressure (**STP**) refers to nominal conditions in the atmosphere at sea level. This value is important to physicists, chemists, engineers, pilots and navigators. Why?

Temperature = 0° C or 273K

Pressure = 1atm

All temperature must be converted to Kelvin

To convert $^{\circ}\text{C} \rightarrow \text{K}$

$$T (\text{K}) = t (^{\circ}\text{C}) + 273$$

To convert $\text{K} \rightarrow ^{\circ}\text{C}$

$$T (^{\circ}\text{C}) = t (\text{K}) - 273$$

Why is the Kelvin scale used exclusively in gas law calculations?